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I, JENNY SHANNON, EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004900259 for a patent by JETSTONE BUILDING SYSTEMS PTY LTD as filed on 20 January 2004.

I further certify that pursuant to the provisions of Section 38(1) of the Patents Act 1990 a complete specification was filed on 17 January 2005 and it is an associated application to Provisional Application No. 2004900259 and has been allocated No. 2005204590.



WITNESS my hand this  
Twentieth day of April 2010

JENNY SHANNON  
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AUSTRALIA

Patents Act 1990

**PROVISIONAL SPECIFICATION**

**Applicant(s) :**

JETSTONE BUILDING SYSTEMS PTY LTD

**Invention Title:**

COMPOSITE CONSTRUCTIONAL ELEMENT AND METHOD OF  
MANUFACTURING A COMPOSITE CONSTRUCTIONAL ELEMENT

The invention is described in the following statement:

COMPOSITE CONSTRUCTIONAL ELEMENT AND METHOD OF  
MANUFACTURING A COMPOSITE CONSTRUCTIONAL ELEMENT

FIELD OF THE INVENTION

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The present invention relates to a composite constructional element and a method of manufacturing such a composite constructional element. In particular, the constructional element is of the type suitable for 10 constructing a wall, floor or roof.

BACKGROUND TO THE INVENTION

Building systems in the form of prefabricated modular 15 building systems have a tendency to rely upon heavy machinery for their construction, are generally labour intensive and may require many different tradespersons for construction. Although such systems may be modular, they may require the separate construction and application of 20 external and internal finishes. An example of components of a prefabricated modular building system is aluminium cladding. Such cladding is typically positioned and fixedly located on the exterior of a fibre panel or wood panel building structure.

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WO02/35026 discloses a constructional element including a structural member in the form of a hollow steel box section and cladding formed about at least part of the structural member. The cladding is formed of a 30 cement based material such as fibre cement. The cladding is moulded around the structural member and includes a abutment means in the form of a protrusion along one edge and a mating channel along the other edge, so that

adjacent constructional elements can be aligned. The constructional elements are fixed at their ends to support elements.

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The system of WO02/35026 has the advantage that the cladding material can be provided with a number of different finishes.

10 SUMMARY OF THE INVENTION

According to the present invention, a composite constructional element comprises:

15 a plank profile forming a rear face and two opposed edge sections of the constructional element; and  
a cladding material moulded into the plank profile.

20 According to a second aspect of the present invention, a method of manufacturing a composite constructional element comprises the steps of:

25 providing a plank profile, the plank profile having a rear face and two opposed edge sections; and  
moulding a cladding material into the plank profile.

In the present invention, the cladding material is 30 moulded into the plank profile. Thus, the plank profile itself forms the mould, and there is no requirement for a separate step of moulding the cladding material around a structural member. The resulting composite constructional

element can be made thinner and lighter than prior art constructional elements. As in the prior art, the cladding material can be provided with a number of different 5 finishes to resemble masonry.

Preferably, the cladding material forms substantially an entire front face of the constructional element, which is preferably substantially flat. Thus, there is little 10 or no part of the plank profile visible when the constructional elements are assembled, for instance, to form a wall.

Preferably, each edge section of the plank profile 15 includes an attachment formation for attachment to an adjacent building element.

Preferably, the attachment formations comprise a channel formed on one edge section and a lip formed on the 20 opposed edge section, wherein the lip is capable of clipping into a channel on an adjacent constructional element.

Preferably, the plank profile, including the rear 25 face, the edge sections and the attachment formations, is integrally formed from a sheet material.

Preferably, the plank profile is formed from sheet 30 steel, which preferably is roll formed. This is a particularly simple and effective manufacturing method for forming such profiles.

Preferably, the plank profile includes at least one longitudinal stiffening formation. This is particularly useful when the constructional elements are used to form a load bearing structure such as a floor. Preferably, the or each stiffening formation comprises a ridge. This can be formed as a channel in the plank profile which is filled with cladding material.

10 Preferably, the cladding material is cement, concrete, fibre cement, fibreglass, cellulose, foamed polymeric material, ceramics or polystyrene. More, preferably, the cladding material is a cement based material, particularly glass reinforced cement.

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BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the present invention will now be described with reference to the accompanying drawings, in which:-

Figure 1 is a side elevation showing a plurality of interconnected constructional elements;

25 Figure 2 is a side elevation illustrating a plurality of interconnected constructional elements forming a corner;

30 Figure 3 is an elevated view of a join between ends of constructional elements; and

Figure 4 is an exploded section of a constructional element and a sealing element.

DETAILED DESCRIPTION

Figure 1 illustrates a plurality of constructional elements 1 interconnected to form cladding for fixing to the outside of a wall. Each composite constructional element 1 comprises a plank profile 2 and a cladding material 3. The plank profile 2 could be formed from a number of suitable materials including plastics, fibre glass or carbon fibre, but in this preferred embodiment, the plank profile 2 is formed from sheet steel. The cladding material 3 could be cement, concrete, fibre cement, fibre glass, cellulose, foamed polymeric material, ceramics or polystyrene, but is preferably a cement based material, and in this preferred embodiment, the cladding material 3 is glass reinforced cement. Glass reinforced cement is a known product that is currently used for moulding and casting building panels and architectural details.

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The folded plank profile 2 includes a first edge section 4, a second edge section 5 and a rear face 6, which form a mould for the cladding material 3.

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The first edge section 4 includes an edge face 4a which projects frontwards with respect to the rear face 6, and acts to retain cladding material 3 at one edge of the constructional element 1. The first edge section 4 also includes an attachment formation in the form of a lip 4b which projects backwards from the rear face 6. The lip

formation 4b is formed as a channel in the plank profile 2 which is filled with cladding material 3.

The second edge section 5 includes an edge face 5a which projects frontwardly from the rear face 6 and acts to retain cladding material 3 at the opposed edge of the 5 constructional element 1. The second edge section 5 also includes a second attachment portion in the form of a channel 5b which projects laterally beyond the second edge face 5a. The channel 5b extends backwards from the rear face 6 and is shaped to receive lip 4b of an adjacent 10 constructional element 1.

The rear face 6 also includes longitudinal ridge formations, 6b, 6c, which are formed as channels projecting backwardly from the plane of the rear face 6. 15 These channels 6b, 6c are filled with cladding material 3 and serve to stiffen the constructional element 1.

The entire plank profile 2 is formed from a single sheet of steel. In the preferred embodiment, the plank profile 2 is formed by roll-forming. The process of roll-forming involves the feeding of a flat profile of light gauge steel through a roll-forming machine to provide a desired profile. This is a well-known and widely used technology for the purpose of making roof sheeting, wall 20 studs etc. Once the profile 2 is formed, the cladding material 3 is moulded into the plank profile such that it is bounded by the rear face 6 and the edge faces 4a, 5a. The cladding material 3 covers substantially an entire 25 front face of the building element and forms a flat front surface. The only part of the front face of the 30 constructional element which is not covered by the cladding material 3 is the edge section 5. When the

constructional elements 1 are interconnected, the edge section 5 is substantially covered by an adjacent constructional element 1 as the lip 4b clips into channel 5b. A narrow portion 5c remains exposed, which may be reduced to a width of approximately 2-3mm and which may be covered by an appropriate joint compound.

The constructional element 1 can be formed by this method and supplied in standard lengths which can be readily cut to any required length. Because the rolled steel profile 2 acts as a mould for the cladding material 3, the method of manufacturing does not require any separate moulding step, thus eliminating the need for any separate moulds, and the associated storage, handling and cleaning of such.

To assemble the constructional elements 1 to form cladding or panelling on a wall, a first constructional element 1 is fixed to an upright in the form of a timber upright 8 by screws which are fixed through screw holes 7 which are located at the base of channel 5b. Alternatively, self-drilling screws, rivets, staples, or nails, may be used, in which case the screw holes 7 are not required. Once a first constructional element 1 is fixed to the upright 8, a second constructional element 1 is positioned by clipping lip 4b into channel 5b of the first constructional element 1 which is fixed to the upright 8. The screws 7 are concealed by the overlying second constructional element 1. The second constructional element can then be screwed to the upright 8. The constructional elements 1 can also be fixed to a frame having a steel stud in a similar way. The constructional

elements 1 are particularly thin, in this preferred embodiment having a thickness of approximately 20mm, and thus, when used as cladding or

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panelling on a wall, the floor space of the room is not substantially reduced. The constructional elements 1 are also light and easy to handle, and require no specially adapted support structure but can be screwed to any conventional frame or wall.

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Ends of constructional elements 1 can be joined by means of a sealing element 10, which is preferably formed from a waterproof plastics material such as neoprene. The sealing element 10 can be provided directly between the 15 ends of constructional elements 1, as illustrated in Figures 2 and 4, or between the ends of constructional elements 1 and a joining member 11 as illustrated in Figures 1 and 3. The joining member 11 is provided as a U shaped channel, wherein constructional elements 1 abut 20 each side with a sealing element 10 interposed therebetween. A cover member 12 can be clipped into the joining member 11, which is screwed to the frame or wall by screws 13.

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Figures 1 and 2 also illustrate corner members 14 which are screwed to a timber upright 8 and have flanges which abut the ends of the constructional elements 1. A sealing element 10 is provided between the ends of the constructional elements and the flanges 14a, 14b. The 30 corner members 14, and joining members 11 can also be manufactured from roll formed steel.

In the claims which follow and in the preceding description of the invention, except where the context requires otherwise due to express language or necessary implication, the word "comprise" or variations such as "comprises" or "comprising" is used in an inclusive sense, i.e. to specify the presence of the stated features but not to preclude the presence or addition of further features in various embodiments of the invention.

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It is to be understood that a reference herein to a prior art publication does not constitute an admission that the publication forms a part of the common general knowledge in the art in Australia, or any other country.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A composite constructional element comprising:

5 a plank profile forming a rear face and two opposed edge sections of the constructional element; and

a cladding material moulded into the plank profile.

- 10 2. A composite constructional element according to claim 1, wherein the cladding material forms substantially an entire front face of the constructional element.

- 15 3. A constructional element according to claim 1 or 2, wherein each edge section includes an attachment formation for attachment to an adjacent constructional element.

4. A constructional element according to claim 3, 20 wherein the attachment formations comprise a channel formed on one edge section and a lip formed on the opposed edge section, wherein the lip is capable of clipping into a channel on an adjacent constructional element.

- 25 5. A constructional element according to any one of the preceding claims, wherein the plank profile, including the rear face, the edge sections and the attachment formations, is integrally formed from a sheet material.

- 30 6. A constructional element according to claim 5, wherein the plank profile is formed from sheet steel.

7. A constructional element according to claim 6,  
wherein the plank profile is roll formed.

5 8. A constructional element according to any one of the  
preceding claims, wherein the plank profile includes at  
least one longitudinal stiffening formation.

9. A constructional element according to claim 8,  
10 wherein the stiffening formation comprises a ridge.

10. A constructional element according to any one of the  
preceding claims, wherein the cladding material is cement,  
concrete, fibre cement, fibreglass, cellulose, foamed  
15 polymeric material, ceramics or polystyrene.

11. A constructional element according to any one of the  
preceding claims, wherein the cladding material is glass  
reinforced cement.

20 12. A method of manufacturing a composite constructional  
element comprising the steps of:

25 providing a plank profile, the plank profile having a  
rear face and two opposed edge sections; and

moulding a cladding material into the plank profile.

13. A method according to claim 12, wherein the cladding  
30 material forms substantially an entire front face of the  
constructional element.

14. A method according to claim 12 or 13, wherein each edge section includes an attachment formation for attachment to an adjacent constructional element.

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15. A method according to claim 14, wherein the attachment formations comprise a channel formed on one edge section and a lip formed on the opposed edge section, wherein the lip is capable of clipping into a channel on 10 an adjacent constructional element.

16. A method according to any one claims 12 to 15, wherein the plank profile, including the rear face, the edge sections and the attachment formations, is integrally 15 formed from a sheet material.

17. A method according to claim 16, wherein the plank profile is formed from sheet steel.

20 18. A method according to claim 17, wherein the plank profile is roll formed.

19. A method according to any one of claims 12 to 18, wherein the plank profile includes at least one 25 longitudinal stiffening formation.

20. A method according to claim 19, wherein the stiffening formation comprises a ridge.

30 21. A method according to any one of claims 12 to 20, wherein the cladding material is cement, concrete, fibre cement, fibreglass, cellulose, foamed polymeric material, ceramics or polystyrene.

22. A method according to any one of claims 12 to 21,  
wherein the cladding material is glass reinforced cement.

5 Dated this 16<sup>th</sup> day of January 2004

JETSTONE BUILDING SYSTEMS PTY LTD

By their Patent Attorneys

GRIFFITH HACK

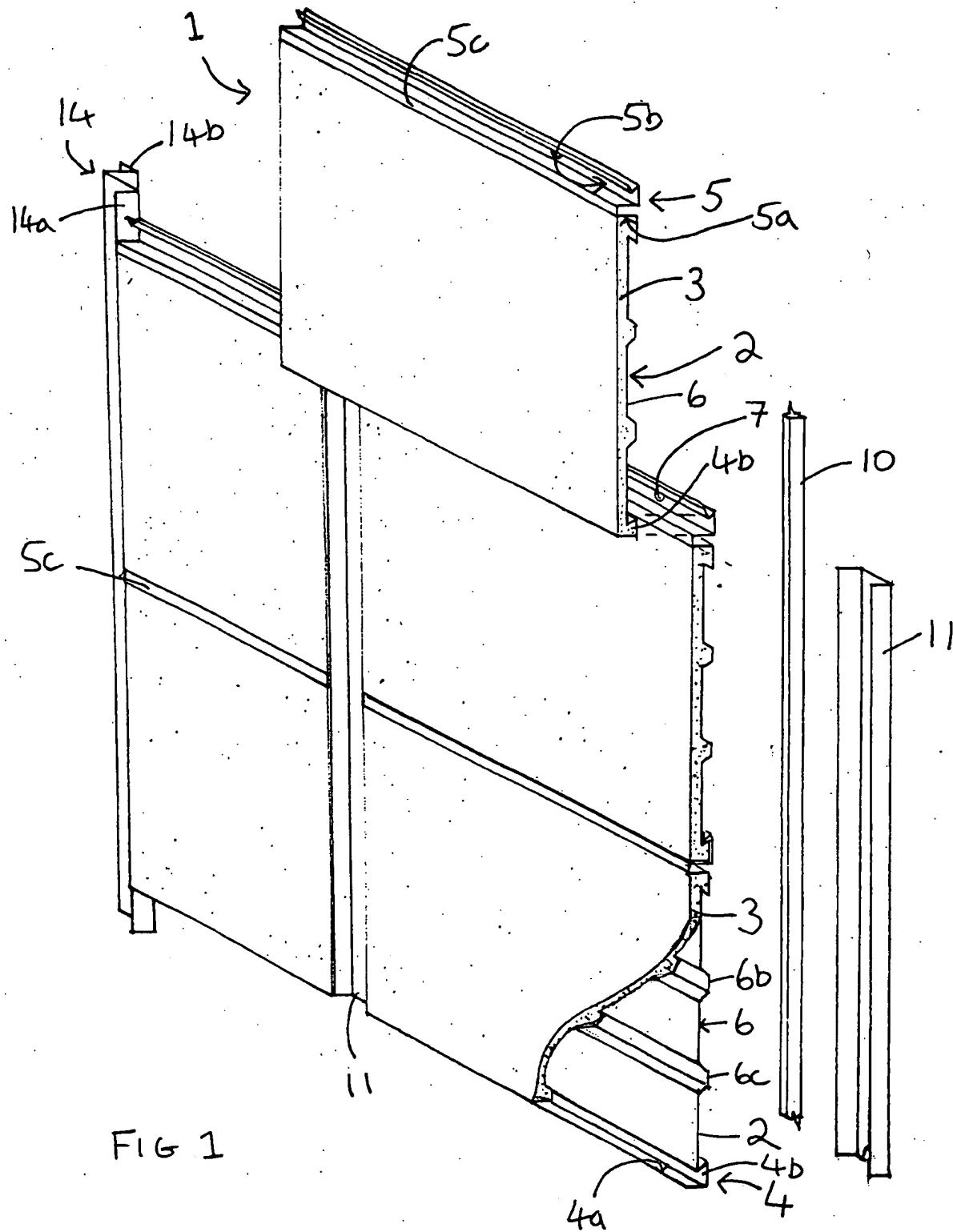


FIG 1

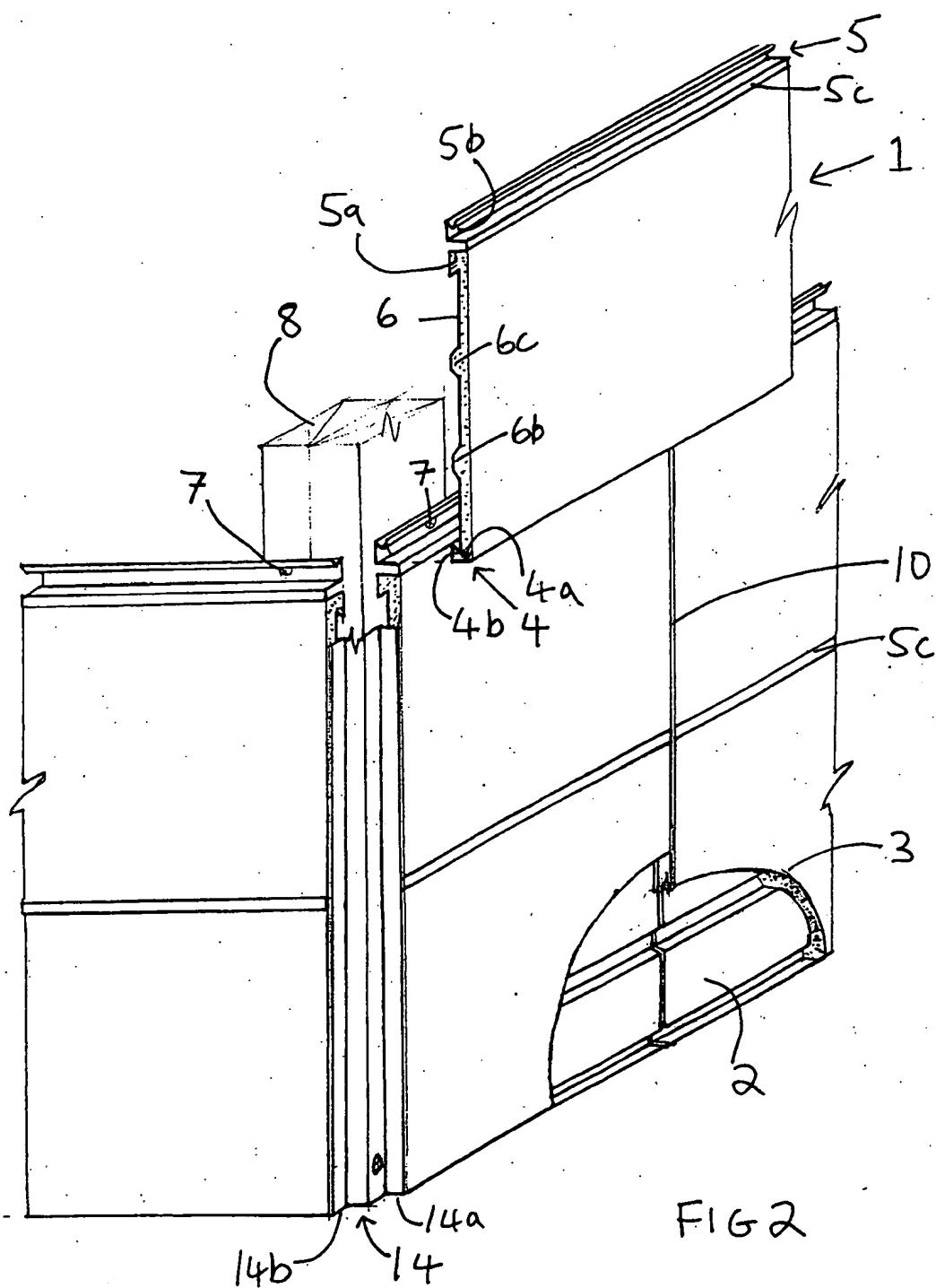


FIG 2

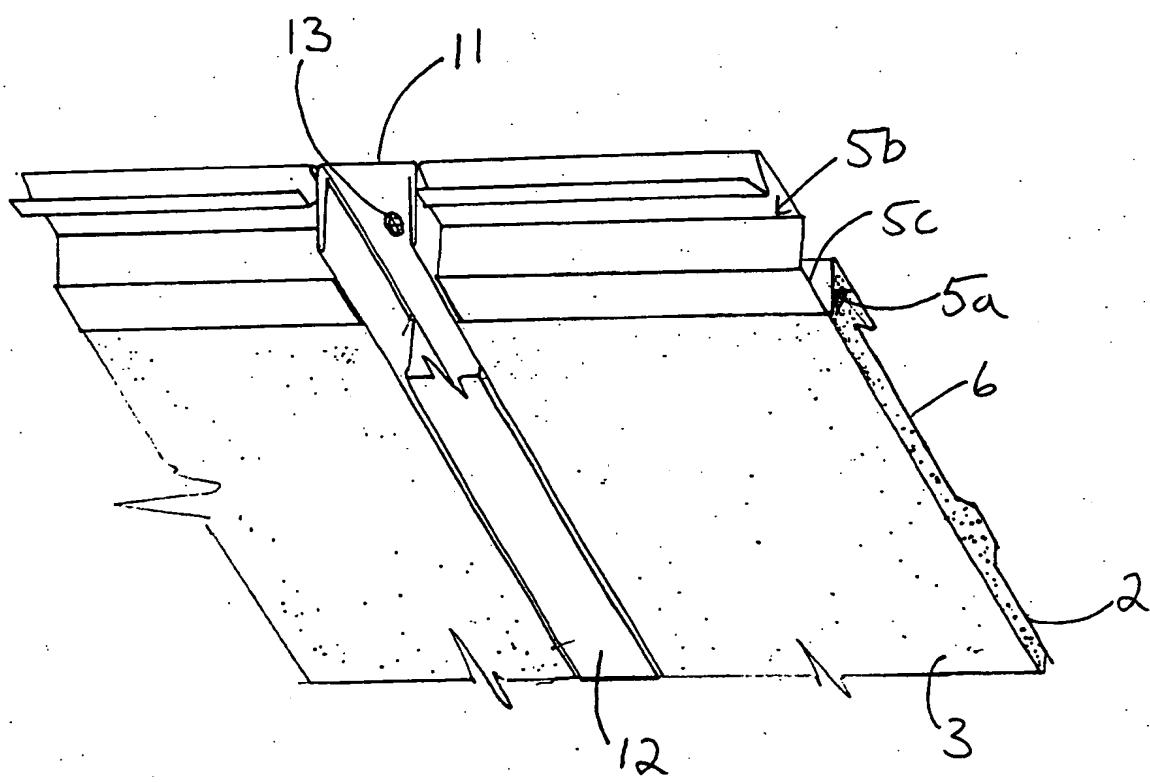


FIG 3

